THE FERTILIZER SITUATION

1963-1964

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THE FERTILIZER SITUATION FOR 1963-64

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Supplies of fertilizer materials for 1963-64 are expected to total 10,761,000 tons of plant nutrients: nitrogen (N), phosphate (P_2O_5) and potash (K_2O). This would be an increase of nearly 10 percent over 1962-63. This supply of plant nutrients almost equals the gross tonnage of mixed fertilizers and fertilizer materials used 21 years ago. Gross fertilizer consumption in 1942-43 amounted to 11,466,000 tons.

Levels of production by primary producers from the beginning of the fertilizer year 1/ reflect the manufacturers' belief that 1963-64 would be an even bigger fertilizer year than 1962-63. In fact, 1962-63 had been a better year than some producers anticipated. Some sales were lost because producers were not able to deliver when farmers were willing to take the fertilizers.

Producers started early in the present fertilizer year to replenish inventories and prepare for the fall season. Some new producers completed ammonium nitrate or other plant units for production of nitrogen chemicals before their ammonia units were finished or their planned sources of ammonia were prepared to deliver. Where possible, these new firms purchased ammonia from other producers to get started. Ammonia producers themselves have been purchasing ammonia elsewhere when their current production was not sufficient to meet anticipated requirements. Some expansions and new plants will not be completed in time to take advantage of expected marketing opportunities immediately ahead. These various situations together may have exaggerated an apparent tight supply position for ammonia.

The rush by farmers to obtain fertilizers is about to get underway. New anhydrous ammonia stations, new nitrogen solutions stations and many more bulk blending plants have been added to serve the growing market. Presumably the tremendous increase in ammonia production and additional facilities should be sufficient to take care of requirements. Yet ammonia is reported to be in short supply and will become less available at the height of the rush season. This is assuming favorable conditions during the current planting season. Weather conditions for the past three years have favored heavy use of fertilizer. Production schedules anticipate similarly favorable weather for the current year. Rain for extended periods would offset somewhat the short

1/ The fertilizer year is from July 1 through June 30.

supply position for ammonia and might be severe enough to reduce the quantity of plant nutrients sold. Even with adequate supplies, spot shortages occur because the distribution system cannot handle the physical volume demanded by farmers during a favorable planting season. Reports indicate that ammonia, urea, ammonium sulfate, and coarse and granular potassium chloride even now are in a tight supply position.

The estimates presented in this report are based on the trends shown by published production and inventory statistics for the first six months of the fertilizer year (July-December) and on foreign trade data supplemented by information from the industry.

Nitrogen (N)

Supplies of nitrogenous fertilizer materials for 1963-64 will reach a record level of 4,462,000 tons of nitrogen (N), an increase of 12 percent over 1962-63 and more than twice the supply ten years ago (table 1).

Production of anhydrous ammonia during the first six months of the current fertilizer year followed the seasonal pattern established over the last several years. Anhydrous ammonia production each month was 52,000 to 110,000 tons greater than in the corresponding month a year ago. In one month (December 1963) anhydrous ammonia production exceeded ammonia production for the entire fertilizer year 1945-46 by about 78,000 tons. Anhydrous ammonia for direct application and for formulation of mixed fertilizers will probably be up this year about 185,000 tons N (14 percent). Nitrogen solutions will be up about 61,000 tons N (6 percent). Solid ammonium nitrate for fertilizer is expected to be up about 105,000 tons of N (19 percent) more than in 1962-63. Ammonium sulfate will be about 32,000 tons N (8 percent) less than last year. Solid urea for fertilizer purposes will be up about 13,000 tons N (nearly 6 percent). Other solid nitrogenous fertilizer materials will be up about 147,000 tons N (37 percent) largely from increased production of ammonium phosphates.

Imports of nitrogen (N) will increase about 31,000 tons N, or 9 percent, over 1962-63. Those of ammonium nitrate-limestone mixtures which are reported to be in a tight supply situation in Europe are expected to be even smaller than last year. Calcium cyanamide and calcium nitrate also are expected to decline in volume. All other nitrogenous products are expected to make gains, the greatest being in urea and nitrogen solutions.

Table 1. -- NITROGEN: estimated supply of nitrogen for fertilizer purposes, 1962-63 and 1963-64, United States and possessions

(1,000 short tons of N)

Item	1962-63 1/	1963-64
Supply from domestic source		
Solids:		
Ammonium nitrate 2/	546	651
Ammonium sulfate 2/	382	350
Urea	227	240
All other solids	397	544
Total solids	1,552	1,785
Liquids:		
Ammonia (including aqua)	1,281	1,466
All Other	1,001	1,062
Total liquids	2,282	2,528
Total (solids and liquids)	3,834	4,313
Imports		
Ammonium nitrate	85	92
Ammonium sulfate	47	54
Urea 2/	39	57
Ammonium nitrate-limestone mixtures	13	4
Sodium nitrate	61	64
Nitrogen solutions	22	27
All Other	77	77
Total	344	375
Exports		
Ammonium nitrate	9	9
Ammonium sulfate	102	94
Urea	11	17
Ammonia (including aqua)	41	55
All Other	33	51
Total	196	226
NET DOMESTIC SUPPLY	3,982	4,462

1/ Revised.
2/ Adjusted for estimated quantity going into non-fertilizer uses.

Exports of nitrogen may be up 15 percent (about 30,000 tons N) over last year. Urea, ammonia, ammonium phosphates and mixed fertilizers have all moved out of the United States in larger volume than during the same period last year. Exports of ammonium sulfate are expected to be about 8 percent or 8,000 tons N less than in 1962-63.

Estimated capacity of the 75 U. S. anhydrous ammonia plants now on stream is 7.8 million tons. Expansions of existing plants and new construction are expected to increase this to 8.6 million tons by the end of the calendar year 1964. Enough new ammonia plants are reported planned to push the total to over 10 million tons. Producers of solid fertilizer-grade ammonium nitrate now number about 28. Urea plants now number 23 and five more have been announced or are actually under construction which will bring urea capacity to about 1.7 million tons of material.

Phosphates (P_2O_5)

Supplies of phosphates for fertilizers in 1963-64 are expected to total 3,492,000 tons of P_2O_5, 10 percent more than 1962-63 (table 2).

The supply of normal and enriched superphosphate will decline about 8 percent. Imports of these materials will be about 20 percent less than last year. This is a continuation of the trend started in 1951-52.

Concentrated superphosphate supplies are expected to be up about 15 percent over 1962-63. That year was the first since 1945-46 that concentrated superphosphate supplies had not attained a new record. Current trends point toward regaining last year's loss and even exceeding the record quantity of 1961-62. Imports are likely to be down about one-third from a year earlier. Exports are now markedly ahead of last year but the total for the year is expected to be only slightly higher than a year ago.

Supplies of ammonium phosphates are likely to be nearly 50% over last year. Imports are expected to be about 20 percent less than in 1962-63. Exports may be nearly double those of the previous year.

Supplies of wet and furnace phosphoric acid for direct application and for formulation of dry and liquid mixed fertilizers will be up about 10 percent. The major producers of phosphoric acid (H_3PO_4) for fertilizer use also have facilities for turning out

Table 2. -- PHOSPHATE: estimated supply of P_2O_5 for fertilizer purposes, 1962-63 and 1963-64, United States and possessions

(1,000 short tons of available P_2O_5)

Item	1962-63 1/	1963-64
Supply from domestic sources		
Normal and enriched superphosphate	1,243	1,146
Concentrated superphosphate	936	1,075
Ammonium phosphate 2/	619	923
All other 3/	531	559
Total	3,329	3,703
Imports		
Concentrated superphosphate	28	19
Ammonium phosphate	46	37
All other	43	37
Total	117	93
Exports		
Normal superphosphate	25	13
Concentrated superphosphate	202	210
Ammonium phosphate	37	69
All other	11	12
Total	275	304
NET DOMESTIC SUPPLY	3,171	3,492

1/ Revised.
2/ Liquid and solid ammonium phosphate shipped as such by primary producers.
3/ Includes ammonium phosphate (produced in combination with potash salts to make mixed fertilizers), nitric phosphates, sodium phosphate, wet base goods, calcium metaphosphate, natural organics, phosphate rock and colloidal phosphate, basic slag, and estimates of wet and furnace phosphoric acid for liquid and solid mixed fertilizers and direct application.

concentrated superphosphate and ammonium phosphates. This gives flexibility to their operations and enables producers to market P_2O_5 in the form demanded by the trade. Currently about 19 percent of the furnace acid production and about 90 percent of the wet process acid are used in fertilizers.

Normal superphosphate capacity is estimated to be 2,883,000 tons of P_2O_5. Production from 195 plants was reported to Bureau of the Census in 1962, the smallest number sine 1949. Total production was the lowest since 1944.

Concentrated superphosphate capacity is estimated to be 1,439,000 tons of P_2O_5, exclusive of ability to produce the material in some normal superphosphate plants.

Ammonium phosphate capacity is estimated to be in excess of 1.2 million tons of P_2O_5. Either ammonium phosphates or concentrated superphosphate can be produced in some facilities. Phosphoric acid requirements for operating ammonium phosphate and concentrated superphosphate plants at capacity for the year are about 2,250,000 tons of P_2O_5. Shifting more facilities to concentrated superphosphate would reduce the phosphoric acid requirements per unit of P_2O_5 output because part of the P_2O_5 in concentrated superphosphate is derived from phosphate rock. All of the P_2O_5 in ammonium phosphates is from phosphoric acid.

Ammonium phosphates for direct application

The use of selected grades of ammonium phosphates for direct application rose 68 percent in the period 1955-56 to 1958-59 and a further 70 percent again from 1958-59 to 1961-62 (table 3). Ammonium phosphate as the term is commonly used includes monoammonium and diammonium phosphates, mixtures of the two or combinations with ammonium sulfate and/or ammonium nitrate. It is gaining as a direct application material. Bulk blenders use ammonium phosphate, granulators employ it and manufacturers add potash to it in the process of manufacture to produce mixtures containing all three primary nutrients.

The list of grades in Table 3 is not all inclusive. Other grades are made some of which are more difficult to delineate from available data because the same N-P grades are made by combining other N and P_2O_5 source materials.

Table 3. -- U.S. consumption of selected grades of ammonium phosphate for direct application

Grade	Fertilizer Year						
	1955-56	1956-57	1957-58	1958-59	1959-60	1960-61	1961-62
	(s.t.)	(s.t.)	(s.t.)	(s.t.)	(s.t.)	(s.t.)	(s.t.)
11-48-0	47,128	63,885	83,066	103,518	116,383	134,104	138,669
13-39-0	42,127	45,656	45,476	52,010	51,186	49,088	39,604
16-20-0	251,546	259,685	295,015	336,759	378,335	405,749	463,551
27-14-0		11,064	17,683	20,334	24,778	30,156	37,666
21-53-0	13,854	19,780	27,413	26,980	30,881	33,272	39,068
16-48-0	5,092	15,342	19,571	28,824	53,959	100,935	151,455
18-46-0				644	20,388	32,680	81,253
19-38-0	1,642	9,384					
23-23-0				8,001	12,910	18,763	19,079
24-20-0	350	4,414	8,062	12,237	13,822	29,047	20,319
30-10-0			1,259	10,620	13,601	17,245	35,599
18-36-0				9,299	11,875	9,732 1/	10,625
Total	361,739	429,210	497,545	609,226	728,118	860,771 1/	1,036,888
N content	55,028	66,950	78,227	97,550	117,973	141,516 1/	173,660
P_2O_5	99,841	124,253	144,747	177,300	217,977	265,355 1/	326,608

Source: "Consumption of Commercial Fertilizers and Primary Plant Nutrients in the United States," Agricultural Research Service, U.S. Department of Agriculture. Nitrogen and phosphate content calculated.

1/ Revised figures.

Potash (K_2O)

Supplies of potash for fertilizers in 1963-64 are expected to total 2,807,000 tons of K_2O, an increase of 6 percent over 1962-63 (table 4).

Domestic deliveries of potassium chloride will be about the same as last year. Imports are expected to be up about 42 percent over 1962-63, and nearly 3 times imports in 1961-62. Quantities from Europe have increased slightly but more than one-half of the total for 1963-64 will come from Canada. Exports are likely to be slightly larger than last year.

Potassium sulfate and potassium magnesium sulfate supplies are expected to be about 7 percent larger than last year. Imports will be up 5 percent and exports will return to the 1961-62 level if the trend in out-shipments continues.

Potassium nitrate has become available this year as a new fertilizer material from a domestic producer. This provides another source of potash for crops which are sensitive to, or their quality is affected by, chlorides. Potassium nitrate in this case is made by reacting nitric acid and potassium chloride.

Current domestic potash capacity is estimated to be about 3,000,000 tons of K_2O from eight plants. Production of marketable potash in calendar 1963 was nearly 2.9 million tons of K_2O. Two new facilities are under construction. These two plants will add over 900,000 tons of K_2O to current U. S. capacity. Three of the present producers have modifications or expansions underway which will increase capacity even more.

Two facilities in Canada are scheduled to begin production in 1965, bringing the Canadian capacity to over one-half U. S. capacity. Further facilities are planned to be developed in Canada.

Table 4. -- POTASH: estimated supply of K_2O for fertilizer purposes, 1962-63 and 1963-64, United States and possessions

(1,000 short tons of K_2O)

Item	1962-63 1/	1963-64
Supply from domestic sources		
Potassium chloride	2,396	2,385
Potassium sulfate 2/	143	153
All other	30	35
Total	2,569	2,573
Imports		
Potassium chloride	410	584
Potassium sulfate 2/	59	62
All other	17	16
Total	486	662
Exports		
Potassium chloride	383	394
Potassium sulfate 2/	18	23
All other	10	11
Total	411	428
NET DOMESTIC SUPPLY	2,644	2,807

1/ Revised.
2/ Includes potassium-magnesium sulfate.

Inventories

Stocks of all nitrogenous materials held by producers at the end of December were probably smaller than a year ago (table 5). Prior to 1963, manufacturers reported only stocks held at producing locations. The method of reporting was changed in 1963 to include stocks held by primary producers both at their plants and at out-of-plant storages. Ammonium sulfate inventories were below a year ago.

Normal and concentrated superphosphate inventories were down from last year. Ammonium phosphate inventories were up about one-fourth, still manageable at this time of year. Total P_2O_5 inventories were down 7 percent from the previous December.

Table 5. -- Inventories End of the Month
(tons)

Commodity	December 1962 1/	December 1963 2/	1963 February 2/	1963 June 2/
Anhydrous ammonia	383,719	474,195	613,806	102,793
Ammonium nitrate solution--fert. use	72,621	75,380	80,165	28,234
Ammonium nitrate - solid fert. use	91,523	134,626	195,099	51,758
Ammonium sulfate	116,945	100,622	136,445	38,989
Ammonium sulfate - coke oven	115,535	113,826	86,394	26,083
Nitrogen solutions	88,528	140,001	146,818	20,237
Normal and enriched superphosphate (P_2O_5)	194,435	176,419	188,537	138,660
Concentrated superphosphate (P_2O_5)	207,676	159,740	204,255	160,396
Ammonium phosphates and other (P_2O_5)	121,605	150,947	96,893	73,150
Total (P_2O_5)	523,716	487,106	489,685	372,206

1/ Stocks of nitrogenous materials at producing locations only.
2/ Total stocks of nitrogenous materials of producing companies, including amounts held at locations other than company plants.

Foreign Trade in Fertilizers

The United States has been a net importer of nitrogen (N), a net exporter of processed phosphates (P_2O_5), and half the time either a net importer or a net exporter of potash (K_2O) during the last twelve years (table 6). Products not produced domestically (Chilean sodium nitrate, calcium nitrate and calcium cyanamide) and ammonium nitrate are largely the cause of the U. S. being a net importer of nitrogen (N). P_2O_5 exports exceed imports, and in addition, phosphate rock exports have ranged from 1.5 to nearly 5 million tons a year during the twelve years. U. S. potash production exceeded one-half million tons of K_2O for the first time in 1941, at which time the U. S. became a net exporter and continued thus through 1949. Imports exceeded exports in 1950 and continued to do so through 1955-56. Exports exceeded imports then for a period of six years, until Canadian potash production shifted the balance to imports.

Canadian materials account for about 50 percent of the total tonnage of imported fertilizers and fertilizer materials (table 7). This tonnage is likely to increase as other producers with established U. S. markets start up potash facilities in Canada. Imports of sodium nitrate and ammonium nitrate-limestone mixtures and other less concentrated nitrogen products are declining in volume.

Fertilizers going to Canada are about 11 percent of exports, excluding phosphate rock (table 8). Phosphate rock is about 70 percent of the total export tonnage of fertilizers and fertilizer materials. About 29 percent of the rock went to Japan in 1962-63, 25 percent to Canada and 38 percent to Europe.

Over one-half of the potassium chloride exports last year went to Japan, and about 98 percent of the anhydrous ammonia went to Mexico. Korea took 41 percent of concentrated superphosphate exports and India 61 percent of the ammonium sulfate.

Table 6. -- U. S. Imports and Exports of Primary Plant Nutrients 1952-53 through 1963-64

(1,000 tons)

Fertilizer year	N		P_2O_5		K_2O	
	Imports	Exports	Imports	Exports	Imports	Exports
1952-53	429	44	41	74	159	54
1953-54	421	62	62	88	121	54
1954-55	408	155	70	169	141	97
1955-56	301	239	57	180	151	133
1956-57	294	268	54	256	179	315
1957-58	305	227	59	246	213	252
1958-59	294	223	64	204	238	310
1959-60	298	188	82	177	282	418
1960-61	276	213	67	238	285	484
1961-62	337	234	87	283	282	503
1962-63	344	196	117	275	486	411
1963-64*	375	226	93	304	662	428

*Estimated

Table 7. -- U. S. Imports of Selected Fertilizer Materials by Country of Origin, 1962-63 1/
(short tons of material)

Country of Origin	Ammonium sulfate	Ammonium nitrate 32% & less	Calcium nitrate	Urea	Synthetic nitrogenous materials	Phosphate crude	Potassium chloride	Potassium sulfate	Potassium sodium-nitrate	Fertilizer substance
Canada	153,252		50	68,432	42,187		321,236		523	48,759
Mexico						10,828				16,554
Trinidad				6,564						
Netherlands Antilles						117,907				
Chile									28,739	21,465
Brazil										777
Argentina										265
Norway			11,991	26,048	14,654					5
United Kingdom	298			8,696						3
Netherlands	11,648	23,778	23,420	19,152	1,536					111
Belgium			1,000	39,093			9,350	1,976		
France				1,602	10		161,688	46,634	25	15,774
West Germany	52,361	30,874	11,999	19,352	2,416		150,237	39,356	607	8,692
Switzerland										
USSR										
Spain							40,353	3,781		
Italy	5,844	10,350		13,152				26,205		
Japan	2,150	700		9,263						
New Zealand										
Republic of South Africa				2,532						
French Pacific Islands						6,888				
FWA Togo						36,607				
Colombia										1,785
Czechoslovakia										124
Greece										62
TOTAL	225,553	65,702	48,460	213,886	60,803	172,230	682,864	117,952	29,894	114,376

1/ Other materials imported, mainly from Canada, were the following: 254,524 tons of ammonium nitrate over 32%, 73,559 tons of nitrogen solutions, 33,987 tons of calcium cyanamide, 153,850 tons of ammonium phosphates, 162,175 tons of mixed fertilizers, 60,317 tons of concentrated superphosphate, 696 tons of basic slag and 543 tons of other potash; also 378,825 tons of nitrate soda from Chile; 20,238 tons of normal superphosphate from Canada, Venezuela, Netherlands and Japan. Other products were 8,835 tons of guano, 3,394 tons or organic nitrogen materials, 2,034 tons of ammoniated superphosphate and 806 tons of potassium nitrate.

Table 8.-- U. S. Exports of Selected Fertilizer Materials By Destination, 1962-63 1/
(Short tons of material)

	Ammonium sulfate	Anhydrous and aqua ammonia	Ammonium nitrate	Urea	Phosphate rock (all)	Normal super-phosphate	Concentrated super-phosphate	Potassium chloride	Ammonium phosphates	Mixed fertilizers
Canada	2,270	47	264	1,840	1,233,899	104,173	39,488	37,876	3,078	2,883
Mexico	5,840	49,159	14,135	265	197,599	50	3,026	22,495	13,784	2,994
Salvador	4				50		123		530	11,467
Nicaragua	709			1,323		50	121	100	967	10,362
Central America, Other	341	8	684	559	8,212	69	1,496	3,567	6,441	8,443
West Indies, British	77	744	196	39	30	509	369		3	7,767
West Indies, Other	2,814	38	256	477			1,656	1,350	906	6,816
Colombia			396		11,405	2,292	34,983	2,377	2,188	83
Venezuela	251	26	50	63	882		1,429	1,102	110	8,499
Peru			3,598		14,146		145	171	1,531	1,086
Chile		7	730	808	779		101,865	8,036		
Brazil	3,498				119,566	1,329	43,665	13,788	11	8
South America, Other	5,091		651	73	826	30	1,011	1,124	2,301	2,953
Sweden			110		52,273					
Denmark					29,852	69				23
United Kingdom					294,748	52		3,921		1
Ireland	3,584							23,520		
Netherlands				30	106,291		29,137	1,120	32,946	180
Belgium					16,913	9,980		2,352		12
France				339	29,539				10,167	213
West Germany					468,759				13	
Spain	49,142		11	77	39,329				142	43
Italy				38	815,505			30,407		281
Europe, Other			325	246	2,446				1,102	345
India	298,395	5							22,103	14,454
Pakistan	60,084	11		5,577						
Viet-Nam	51,200		62	12,867		1,764	1,529	6,901	11,528	
Phil. Rep.			282		20,495		38	11,432	1,225	80
Japan					1,434,228		97	348,120	2	46
Taiwan					11,550			6,958	8,822	
Korea Rep.							178,701	48,814		
Asia, Other	14	17	906	111	8,511			53	1,034	3,624
Australia	290		3,250	7	12,593		10	22,560	170	1,247
New Zealand								23,727	300	2,187
Rep. of South Africa			20		69			15,018	314	8
Africa, Other	2,288	181	832	30	406		75	847	701	1,551
Other	4		6							
TOTAL	485,896	50,243	26,764	24,769	4,930,901	120,367	438,964	637,736	122,419	87,656

1/ Other materials exported were: 1,499 tons of nitrate of soda, 9,486 tons of synthetic nitrogenous materials n.e.c., 17,362 tons of nitrogenous organic waste, 4,017 tons phosphatic materials, n.e.c., and 35,411 tons of potassic fertilizers, n.e.c.

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